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TI Targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides

IN Kmiec, Eric B.; Gamper, Howard B.; Rice, Michael C.; Kim, Jungsup

PA University of Delaware, USA

SO PCT Int. Appl., 220 pp.

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DT Patent

LA English

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	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001092512	A2	20011206	WO 2001-US17672	20010601
	W:				
	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW:				
	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				

PRAI US 2000-208538P P 20000601

US 2000-244989P P 20001030

US 2001-818875 A 20010327

AB Presented are methods and compns. for targeted chromosomal genomic alterations with modified single-stranded oligonucleotides. The oligonucleotides of the invention have modified nuclease-resistant termini comprising LNA, phosphorothioate linkages, or 2'-O-Me base analogs or combinations of such modifications.

IC ICM C12N015-10

ICS C12N015-11; C12N015-82; C07H021-00; C12N005-10; A01H005-00; C12Q001-68

CC 3-1 (Biochemical Genetics)

Section cross-reference(s): 11

ST gene correction plant cell mutagenic oligodeoxyribonucleotide; locked nucleic acid mutagenic gene correction plant cell; oligoribonucleotide mutagenic gene correction plant cell

IT Oligonucleotides

RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)

(2'-O-Me, mutagenic; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)

IT Oligonucleotides

RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)

(LNA (locked nucleic acids); targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)

IT Proteins

RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)

(QB, engineering triazine resistance in; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)

IT Amino acids, biological studies

Fatty acids, biological studies

RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL

(Biological study); USES (Uses)
(altering plant content of; targeted in vivo mutagenesis of plant genes
using backbone-modified oligonucleotides)

IT Pigments, biological
(blocking synthesis of; targeted in vivo mutagenesis of plant genes
using backbone-modified oligonucleotides)

IT Chlorophylls, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(blocking synthesis of; targeted in vivo mutagenesis of plant genes
using backbone-modified oligonucleotides)

IT Proteins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(calmodulin-binding, engineering lead resistance of; targeted in vivo
mutagenesis of plant genes using backbone-modified oligonucleotides)

IT Herbicide resistance
(engineering of; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

IT Stress, plant
(freezing, resistance to, engineering of; targeted in vivo mutagenesis
of plant genes using backbone-modified oligonucleotides)

IT Recombination, genetic
(gene conversion, gene correction; targeted in vivo mutagenesis of
plant genes using backbone-modified oligonucleotides)

IT Stress, plant
(heavy metal (lead), resistance to, engineering of; targeted in vivo
mutagenesis of plant genes using backbone-modified oligonucleotides)

IT Sulfonylureas
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(herbicidal, engineering resistance to; targeted in vivo mutagenesis of
plant genes using backbone-modified oligonucleotides)

IT Genetic engineering
(in plants, directed of inactivation of enzyme genes in; targeted in
vivo mutagenesis of plant genes using backbone-modified
oligonucleotides)

IT Plant cell
(in vivo site-directed mutagenesis; targeted in vivo mutagenesis of
plant genes using backbone-modified oligonucleotides)

IT Reproduction, plant
(male sterility, engineering of; targeted in vivo mutagenesis of plant
genes using backbone-modified oligonucleotides)

IT Oligonucleotides
Peptide nucleic acids
Phosphorothioate oligonucleotides
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES
(Uses)
(mutagenic; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

IT Stress, plant
(resistance to, engineering of; targeted in vivo mutagenesis of plant
genes using backbone-modified oligonucleotides)

IT Stress, plant
(salinity, resistance to, engineering of; targeted in vivo mutagenesis
of plant genes using backbone-modified oligonucleotides)

IT Mutagenesis
(site-directed, gene correction; targeted in vivo mutagenesis of plant
genes using backbone-modified oligonucleotides)

IT Gene, plant
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(targeted in vivo mutagenesis of plant genes using backbone-modified
oligonucleotides)

- IT 56-87-1, L-Lysine, biological studies 57-10-3, Palmitic acid, biological studies 57-11-4, Stearic acid, biological studies 63-68-3, L-Methionine, biological studies 73-22-3, L-Tryptophan, biological studies 463-40-1, Linolenic acid 9005-25-8, Starch, biological studies 9037-22-3, Waxy starch
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(altering plant content of; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 9029-97-4, 3-Ketoacyl-CoA-thiolase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(engineering 2,4-DB resistance in; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 9029-17-8, Proline oxidase 75922-89-3, Pyrroline-5-carboxylate synthase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(engineering freezing tolerance in; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 9068-73-9, EPSP synthase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(engineering glyphosate resistance in; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 53986-32-6, Protoporphyrinogen oxidase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(engineering herbicide resistance in; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 37256-86-3, Stearoyl ACP desaturase 67880-95-9, .omega.-3 Fatty acid desaturase 68009-83-6, Acyl ACP thioesterase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(engineering of to alter plant fatty acid content; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 7439-92-1, Lead, biological studies
RL: ADV (Adverse effect, including toxicity); BIOL (Biological study)
(engineering plant tolerance to; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 94-82-6, 2,4-DB 1071-83-6, Glyphosate
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(engineering resistance to; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 9027-45-6, Acetolactate synthase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(engineering sulfonyleurea resistance in; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 12654-97-6D, Triazine, derivs. 35724-27-7D, 2-Imidazolinone, derivs.
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(herbicidal, engineering resistance to; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)
- IT 380509-31-9, DNA (tobacco clone WO0192512-SEQID-4350) 380509-32-0 380510-22-5 380510-23-6 380510-24-7 380510-25-8 380510-26-9 380510-27-0 380510-28-1 380510-29-2, DNA (tobacco clone WO0192512-SEQID-4349) 380510-30-5 380510-31-6 380510-32-7, DNA (tobacco clone WO0192512-SEQID-4353) 380510-33-8, DNA (tobacco clone WO0192512-SEQID-4354) 380510-34-9 380510-35-0 380510-36-1, DNA (corn clone WO0192512-SEQID-4357) 380510-37-2, DNA (corn clone WO0192512-SEQID-4358) 380510-38-3 380510-39-4 380510-40-7

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 WO0192512-SEQID-4425) 380511-03-5, DNA (corn clone WO0192512-SEQID-4426)
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 (barley clone WO0192512-SEQID-4441) 380511-19-3, DNA (barley clone
 WO0192512-SEQID-4442) 380511-20-6 380511-21-7 380511-22-8, DNA
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 WO0192512-SEQID-4462) 380511-38-6 380511-39-7 380511-40-0, DNA
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 WO0192512-SEQID-4466) 380511-42-2 380511-43-3 380511-44-4
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 (tobacco clone WO0192512-SEQID-4485) 380511-60-4, DNA (tobacco clone
 WO0192512-SEQID-4486) 380511-61-5 380511-62-6 380511-63-7, DNA
 (tobacco clone WO0192512-SEQID-4489) 380511-64-8, DNA (tobacco clone
 WO0192512-SEQID-4490) 380511-65-9 380511-66-0 380511-67-1, DNA
 (tobacco clone WO0192512-SEQID-4493) 380511-68-2, DNA (tobacco clone
 WO0192512-SEQID-4494) 380511-69-3 380511-70-6 380511-71-7, DNA
 (tobacco clone WO0192512-SEQID-4497) 380511-72-8, DNA (tobacco clone
 WO0192512-SEQID-4498) 380511-73-9, DNA (tobacco clone
 WO0192512-SEQID-4501) 380511-74-0, DNA (tobacco clone
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380512-33-4 380512-34-5 380512-35-6 380512-36-7 380512-37-8
380512-38-9 380512-39-0 380512-40-3 380512-41-4 380512-42-5, DNA
(corn clone WO0192512-SEQID-4597) 380512-43-6, DNA (corn clone
WO0192512-SEQID-4598) 380512-44-7, DNA (corn clone WO0192512-SEQID-4601)
380512-45-8, DNA (corn clone WO0192512-SEQID-4602) 380512-46-9, DNA
(corn clone WO0192512-SEQID-4605) 380512-47-0, DNA (corn clone
WO0192512-SEQID-4606) 380512-48-1, DNA (cotton clone
WO0192512-SEQID-4621) 380512-49-2, DNA (cotton clone
WO0192512-SEQID-4622) 380512-50-5 380512-51-6 380512-52-7
380512-53-8 380512-54-9 380512-55-0
RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)

-- (nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

IT 380512-56-1 380512-57-2 380512-58-3 380512-59-4 380512-60-7
380512-61-8 380512-62-9 380512-63-0 380512-64-1 380512-65-2
380512-66-3 380512-67-4 380512-68-5, DNA (corn clone
WO0192512-SEQID-4657) 380512-69-6, DNA (corn clone WO0192512-SEQID-4658)
380512-70-9 380512-71-0 380512-72-1 380512-73-2 380512-74-3
380512-75-4 380512-76-5 380512-77-6 380512-78-7 380512-79-8
380512-80-1 380512-81-2 380512-82-3 380512-83-4 380512-84-5, DNA
(tobacco clone WO0192512-SEQID-4673) 380512-85-6, DNA (tobacco clone
WO0192512-SEQID-4674) 380512-86-7 380512-87-8 380512-88-9
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WO0192512-SEQID-4761) 380513-16-6, DNA (barley clone
WO0192512-SEQID-4762) 380513-17-7, DNA (wheat clone WO0192512-SEQID-
4765) 380513-18-8, DNA (wheat clone WO0192512-SEQID-4766) 380513-19-9
380513-20-2 380513-21-3 380513-22-4 380513-23-5 380513-24-6
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RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)

(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

IT 380514-92-1 380514-93-2 380514-94-3 380514-95-4 380514-96-5
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RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
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 RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
 (Properties); BIOL (Biological study); USES (Uses)
 (nucleotide sequence; targeted in vivo mutagenesis of plant genes using
 backbone-modified oligonucleotides)

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RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)
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RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)

(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

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380526-70-5 380526-71-6, DNA (wheat clone WO0192512-SEQID-6205)

RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)

(nucleotide sequence; targeted in vivo mutagenesis of plant genes using backbone-modified oligonucleotides)

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RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)

(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

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(olive clone WO0192512-SEQID-6678) 380531-06-6 380531-07-7
380531-08-8, DNA (olive clone WO0192512-SEQID-6681) 380531-09-9, DNA
(olive clone WO0192512-SEQID-6682) 380531-10-2 380531-11-3
380531-12-4, DNA (olive clone WO0192512-SEQID-6685) 380531-13-5, DNA
(olive clone WO0192512-SEQID-6686) 380531-14-6 380531-15-7
380531-16-8, DNA (olive clone WO0192512-SEQID-6689) 380531-17-9, DNA
(olive clone WO0192512-SEQID-6690) 380531-18-0 380531-19-1
380531-20-4 380531-21-5 380531-22-6 380531-23-7 380531-24-8

380531-25-9 380531-26-0 380531-27-1 380531-28-2 380531-29-3
380531-30-6 380531-31-7 380531-32-8 380531-33-9 380531-34-0
380531-35-1 380531-36-2 380531-37-3 380531-38-4 380531-39-5
380531-40-8 380531-41-9 380531-42-0 380531-43-1 380531-44-2
RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)
IT 380531-45-3 380531-46-4 380531-47-5 380531-48-6 380531-49-7
380531-50-0 380531-51-1 380531-52-2 380531-53-3 380531-54-4
380531-55-5 380531-56-6 380531-57-7 380531-58-8 380531-59-9
380531-60-2 380531-61-3 380531-62-4 380531-63-5 380531-64-6
380531-65-7 380531-66-8 380531-67-9 380531-68-0 380531-69-1
380531-70-4 380531-71-5 380531-72-6 380531-73-7 380531-74-8
380531-75-9 380531-76-0 380531-77-1 380531-78-2 380531-79-3
380531-80-6 380531-81-7 380531-82-8 380531-83-9 380531-84-0
380531-85-1 380531-86-2 380531-87-3 380531-88-4 380531-89-5
380531-90-8 380531-91-9 380531-92-0 380531-93-1 380531-94-2
380531-95-3 380531-96-4 380531-97-5 380531-98-6 380531-99-7
380532-00-3 380532-01-4 380532-02-5 380532-03-6 380532-04-7
380532-05-8 380532-06-9 380532-07-0 380532-08-1 380532-09-2
380532-10-5 380532-11-6 380532-12-7 380532-13-8 380532-14-9
380532-15-0 380532-16-1, DNA (cotton clone WO0192512-SEQID-6789)
380532-17-2, DNA (cotton clone WO0192512-SEQID-6790) 380532-18-3
380532-19-4 380532-20-7, DNA (cotton clone WO0192512-SEQID-6793)
380532-21-8, DNA (cotton clone WO0192512-SEQID-6794) 380532-22-9
380532-23-0 380532-24-1, DNA (cotton clone WO0192512-SEQID-6797)
380532-25-2, DNA (cotton clone WO0192512-SEQID-6798) 380532-26-3
380532-27-4 380532-28-5, DNA (cotton clone WO0192512-SEQID-6801)
380532-29-6, DNA (cotton clone WO0192512-SEQID-6802) 380532-30-9
380532-31-0 380532-32-1 380532-33-2 380532-34-3 380532-35-4
380532-36-5 380532-37-6 380532-38-7 380532-39-8 380532-40-1
380532-41-2 380532-42-3 380532-43-4 380532-44-5 380532-45-6
380532-46-7 380532-47-8 380532-48-9 380532-49-0 380532-50-3
380532-51-4 380532-52-5 380532-53-6 380532-54-7 380532-55-8
380532-56-9 380532-57-0 380532-58-1 380532-59-2 380532-60-5
380532-61-6 380532-62-7 380532-63-8 380532-64-9 380532-65-0
380532-66-1 380532-67-2 380532-68-3 380532-69-4 380532-70-7
380532-71-8 380532-72-9 380532-73-0 380532-74-1 380532-75-2
380532-76-3 380532-77-4 380532-78-5 380532-79-6 380532-80-9, DNA
(tobacco clone WO0192512-SEQID-6853) 380532-81-0, DNA (tobacco clone
WO0192512-SEQID-6854) 380532-82-1 380532-83-2 380532-84-3, DNA
(tobacco clone WO0192512-SEQID-6857) 380532-85-4, DNA (tobacco clone
WO0192512-SEQID-6858) 380532-86-5 380532-87-6 380532-88-7, DNA
(tobacco clone WO0192512-SEQID-6861) 380532-89-8, DNA (tobacco clone
WO0192512-SEQID-6862) 380532-90-1 380532-91-2 380532-92-3, DNA
(tobacco clone WO0192512-SEQID-6865) 380532-93-4, DNA (tobacco clone
WO0192512-SEQID-6866) 380532-94-5 380532-95-6 380532-96-7
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380533-02-8 380533-03-9 380533-04-0 380533-05-1 380533-06-2
380533-07-3 380533-08-4 380533-09-5 380533-10-8 380533-11-9
380533-12-0 380533-13-1 380533-14-2 380533-15-3 380533-16-4
380533-17-5 380533-18-6 380533-19-7 380533-20-0 380533-21-1
380533-22-2 380533-23-3 380533-24-4 380533-25-5 380533-26-6
380533-27-7 380533-28-8 380533-29-9 380533-30-2 380533-31-3
380533-32-4 380533-33-5 380533-34-6 380533-35-7 380533-36-8
380533-37-9 380533-38-0 380533-39-1 380533-40-4 380533-41-5
380533-42-6 380533-43-7 380533-44-8 380533-45-9 380533-46-0
380533-47-1 380533-48-2 380533-49-3 380533-50-6 380533-51-7
380533-52-8 380533-53-9 380533-54-0 380533-55-1 380533-56-2

380533-57-3 380533-58-4 380533-59-5 380533-60-8 380533-61-9
380533-62-0 380533-63-1 380533-64-2 380533-65-3 380533-66-4
380533-67-5 380533-68-6 380533-69-7 380533-70-0 380533-71-1
380533-72-2 380533-73-3 380533-74-4 380533-75-5 380533-76-6
380533-77-7 380533-78-8 380533-79-9 380533-80-2

RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)

(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

IT 380533-81-3 380533-82-4 380533-83-5 380533-84-6 380533-85-7
380533-86-8 380533-87-9 380533-88-0 380533-89-1, DNA (corn clone
WO0192512-SEQID-6965) 380533-90-4, DNA (corn clone WO0192512-SEQID-6966)
380533-91-5 380533-92-6 380533-93-7, DNA (corn clone
WO0192512-SEQID-6969) 380533-94-8, DNA (corn clone WO0192512-SEQID-6970)
380533-95-9 380533-96-0 380533-97-1, DNA (corn clone
WO0192512-SEQID-6973) 380533-98-2, DNA (corn clone WO0192512-SEQID-6974)
380533-99-3 380534-00-9 380534-01-0, DNA (corn clone
WO0192512-SEQID-6977) 380534-02-1, DNA (corn clone WO0192512-SEQID-6978)
380534-03-2 380534-04-3 380534-05-4, DNA (wheat clone
WO0192512-SEQID-6981) 380534-06-5, DNA (wheat clone WO0192512-SEQID-
6982) 380534-07-6 380534-08-7 380534-09-8, DNA (wheat clone
WO0192512-SEQID-6985) 380534-10-1, DNA (wheat clone WO0192512-SEQID-
6986) 380534-11-2 380534-12-3 380534-13-4, DNA (wheat clone
WO0192512-SEQID-6989) 380534-14-5, DNA (wheat clone WO0192512-SEQID-
6990) 380534-15-6 380534-16-7 380534-17-8, DNA (wheat clone
WO0192512-SEQID-6993) 380534-18-9, DNA (wheat clone WO0192512-SEQID-
6994) 380534-19-0 380534-20-3 380534-21-4 380534-22-5
380534-23-6 380534-24-7 380534-25-8 380534-26-9 380534-27-0
380534-28-1 380534-29-2 380534-30-5 380534-31-6 380534-32-7
380534-33-8 380534-34-9 380534-35-0 380534-36-1

RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP
(Properties); BIOL (Biological study); USES (Uses)

(nucleotide sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

IT 365952-65-4 365952-66-5 365952-67-6 365952-68-7 365952-69-8
365952-70-1 365952-71-2 365952-72-3 365952-73-4 365952-74-5
365952-75-6 365952-76-7 365952-77-8 365952-78-9 365952-79-0
380690-40-4

RL: PRP (Properties)

(unclaimed sequence; targeted in vivo mutagenesis of plant genes using
backbone-modified oligonucleotides)

=> d bib abs ind 118 2

L18 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2002 ACS
 AN 1998:667152 HCAPLUS
 DN 130:66764
 TI DNA-PHONA-PNA chimeric molecules: contributions to binding against
 complementary DNA
 AU Peyman, A.; Uhlmann, E.; Wagner, K.; Augustin, S.; Weiser, C.; Hein, S.;
 Langner, D.; Breipohl, G.; Will, D. W.
 CS Hoechst Marion Roussel Deutschland GmbH, Frankfurt, D-65926, Germany
 SO Nucleosides & Nucleotides (1998); 17(9-11), 1997-2001
 CODEN: NUNUD5; ISSN: 0732-8311
 PB Marcel Dekker, Inc.
 DT Journal
 LA English
 AB The synthesis of a DNA-phosphonate peptide nucleic acid analog
 (PHONA)-peptide nucleic acid (PNA) chimeric mol. using a monomethoxytrityl
 (Mmt) protection strategy is described. The chimeric oligomer shows
 duplex binding properties that are comparable to the corresponding PNA.
 Thus, PHONA building blocks can be incorporated into PNAs without
 distortion of the PNA structure.
 CC 34-3 (Amino Acids, Peptides, and Proteins)
 Section cross-reference(s): 33
 ST peptide nucleic acid phosphonate analog prepn DNA binding
 IT DNA
 RL: PRP (Properties)
 (complexes, with peptide nucleic acid-peptide nucleic acid phosphonate
 analogs; prepn. and DNA binding properties of DNA-peptide nucleic acid
 phosphonate analog-peptide nucleic acid chimeric mols.)
 IT **Peptide nucleic acids**
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (**phosphonate backbone** analogs; prepn. and DNA
 binding properties of DNA-peptide nucleic acid **phosphonate**
 analog-peptide nucleic acid chimeric mols.)
 IT 217636-83-4P 217636-84-5P 217636-85-6P 217636-86-7P 217636-87-8P
 217636-88-9P 217636-89-0P 217636-90-3P 217636-91-4P 217636-92-5P
 217636-93-6P 217636-94-7P
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (prepn. and DNA binding properties of DNA-peptide nucleic acid
 phosphonate analog-peptide nucleic acid chimeric mols.)
 IT 217636-80-1P 217636-81-2P 217636-82-3P
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (prepn. and DNA binding properties of DNA-peptide nucleic acid
 phosphonate analog-peptide nucleic acid chimeric mols.)
 RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d bib abs ind 118 3

L18 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2002 ACS
 AN 1998:66698 HCAPLUS
 DN 128:241078
 TI Polyamide nucleic acid-DNA chimera lacking the phosphate backbone are novel primers for polymerase reaction catalyzed by DNA polymerases
 AU Misra, Hari S.; Pandey, Pradeep K.; Modak, Mukund J.; Vinayak, Ravi; Pandey, Virendra N.
 CS Department of Biochemistry and Molecular Biology, UMD-New Jersey Medical School, Newark, NJ, 07103, USA
 SO Biochemistry (1998), 37(7), 1917-1925
 CODEN: BICHAW; ISSN: 0006-2960
 PB American Chemical Society
 DT Journal
 LA English
 AB A peptide nucleic acid (PNA) oligomer, an analog of DNA, was examd. for its ability to function as a primer or a template to support DNA synthesis catalyzed by DNA polymerases. The analog, (PNA)19-TpG-OH, comprised of 19 bases in the form of PNA followed by a dinucleotide (TpG-OH) with a single phosphate and a free 3'OH terminus, was recognized as a bona fide primer by 2 reverse transcriptases and also by the Klenow fragment of E. coli DNA polymerase I. The 21-mer PNA chimera is extended on both RNA and DNA templates by all three polymerases. The specificity of binding of the PNA chimeric primer/DNA template at the template-primer binding site of the enzyme was shown by its photo-crosslinking ability to the enzyme which could be effectively competed out by another TP but not by template or primer alone. Furthermore, the chimeric TP-enzyme covalent complex was found to be catalytically active as judged by its ability to incorporate one nucleotide onto the 3'OH terminus of the immobilized primer. PNA sequences were also recognized as template when annealed with a DNA primer. These observations are in variance with the conventional suggestion that the phosphate backbone in the duplex region is essential for recognition and binding by DNA polymerases. The efficient extension of (PNA)19-TpG-OH suggests that the diam. of the duplex region of template primer rather than the phosphate backbone may be sufficient for recognition by DNA polymerases.

CC 7-3 (Enzymes)
 Section cross-reference(s): 6
 ST peptide nucleic acid primer DNA polymerase
 IT Structure-activity relationship
 (DNA polymerase substrate; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

IT **Peptide nucleic acids**
 Primers (nucleic acid)
 RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
 (polyamide nucleic acid-DNA chimera lacking **phosphate backbone** are novel primers for DNA polymerases)

IT 127712-01-0 204935-48-8 204935-49-9
 RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
 (DNA primer; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

IT 204935-51-3
 RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
 (DNA template; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

- IT 204935-50-2
 RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
 (RNA template; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)
- IT 9012-90-2, DNA polymerase 9068-38-6, Reverse transcriptase
 RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
 (polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)
- IT 204997-30-8 204997-31-9
 RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
 (polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)